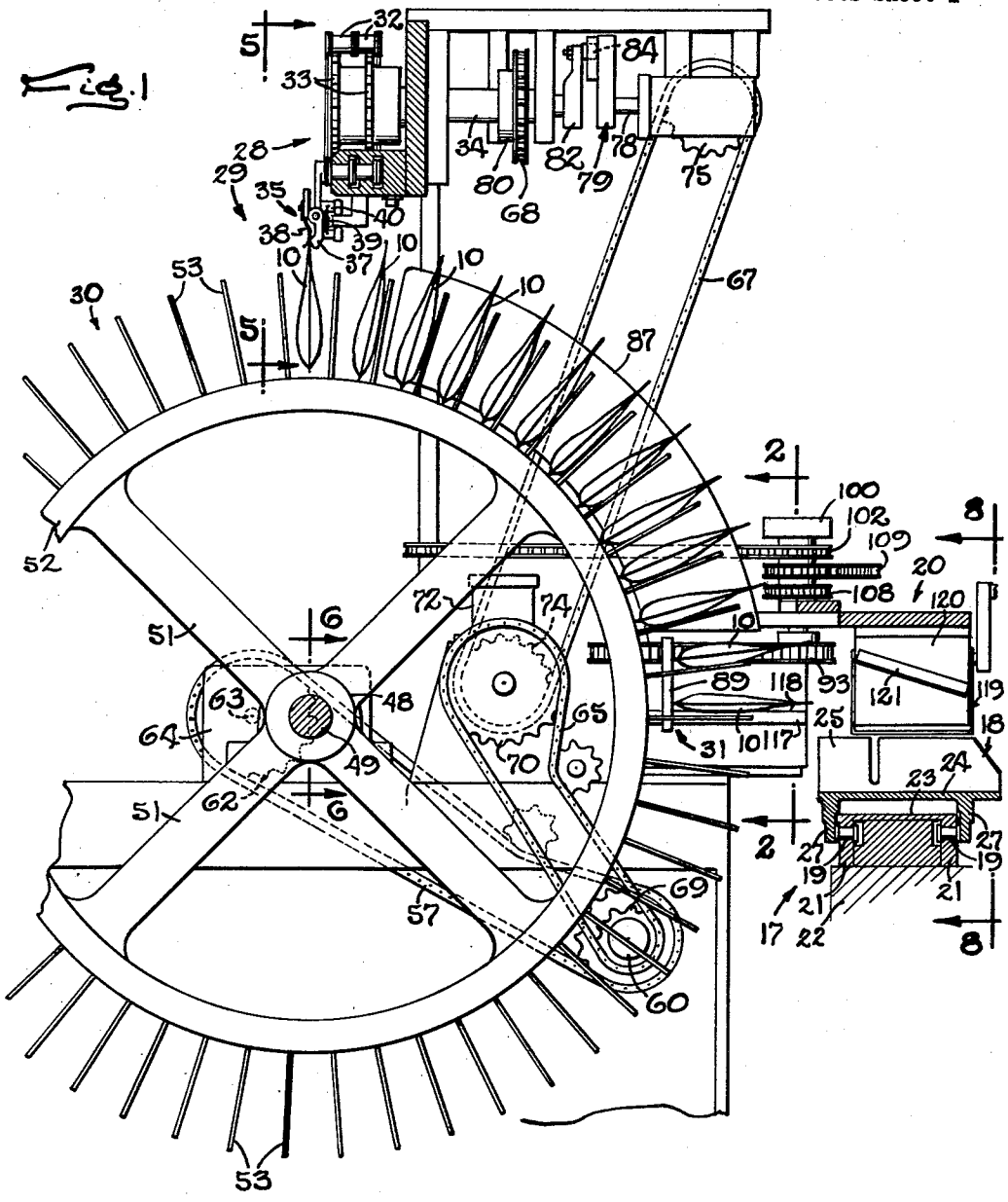
June 29, 1965 LE ROY L. MARTIN 3,191,748

PACKAGING MACHINE

Filed July 30, 1963 6 Sheets-Sheet 1

Fig. 1



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by Wolfe, Hubbard, Voit & Osann

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PACKAGING MACHINE

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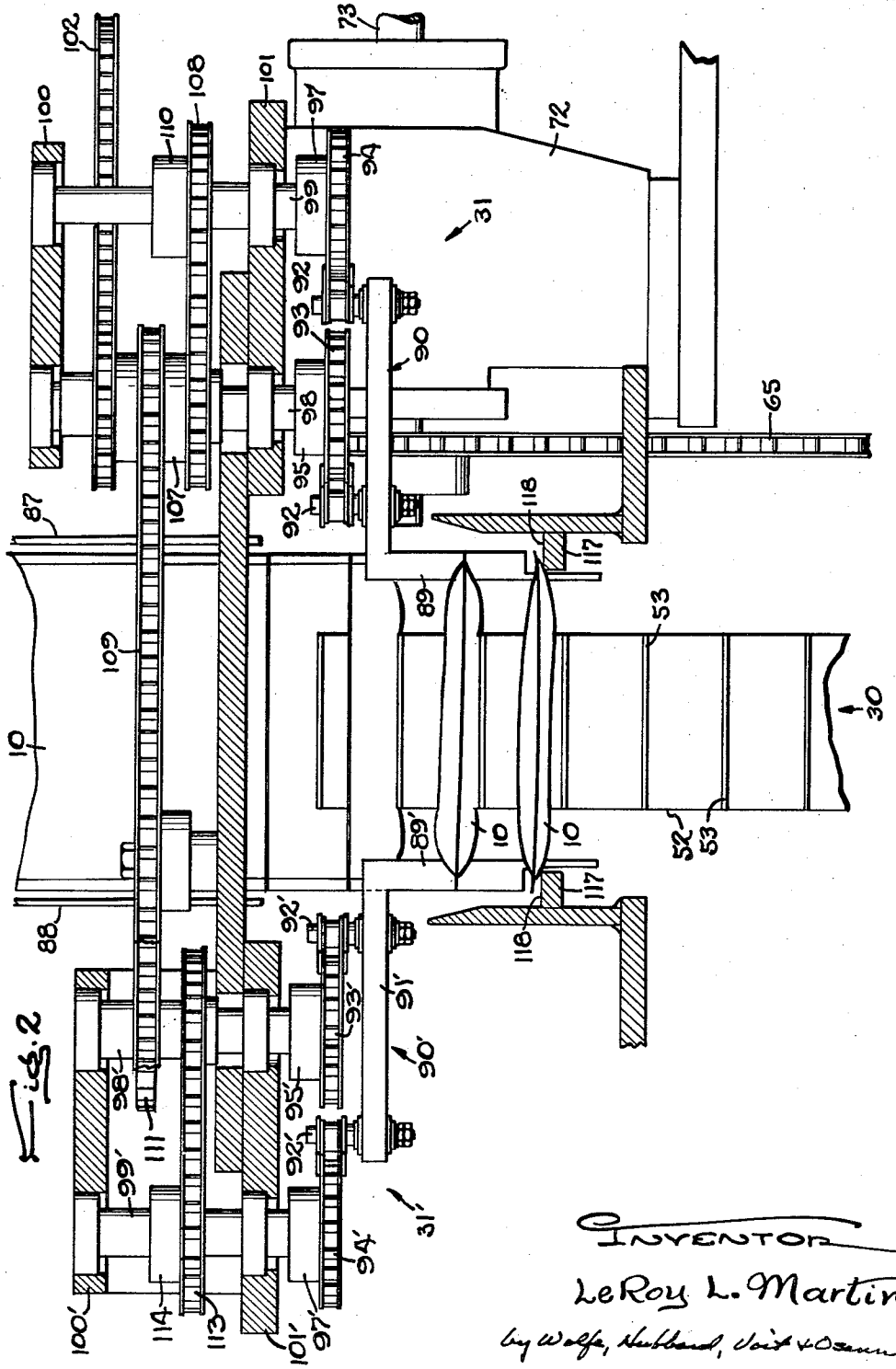

Fig. 2

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PACKAGING MACHINE

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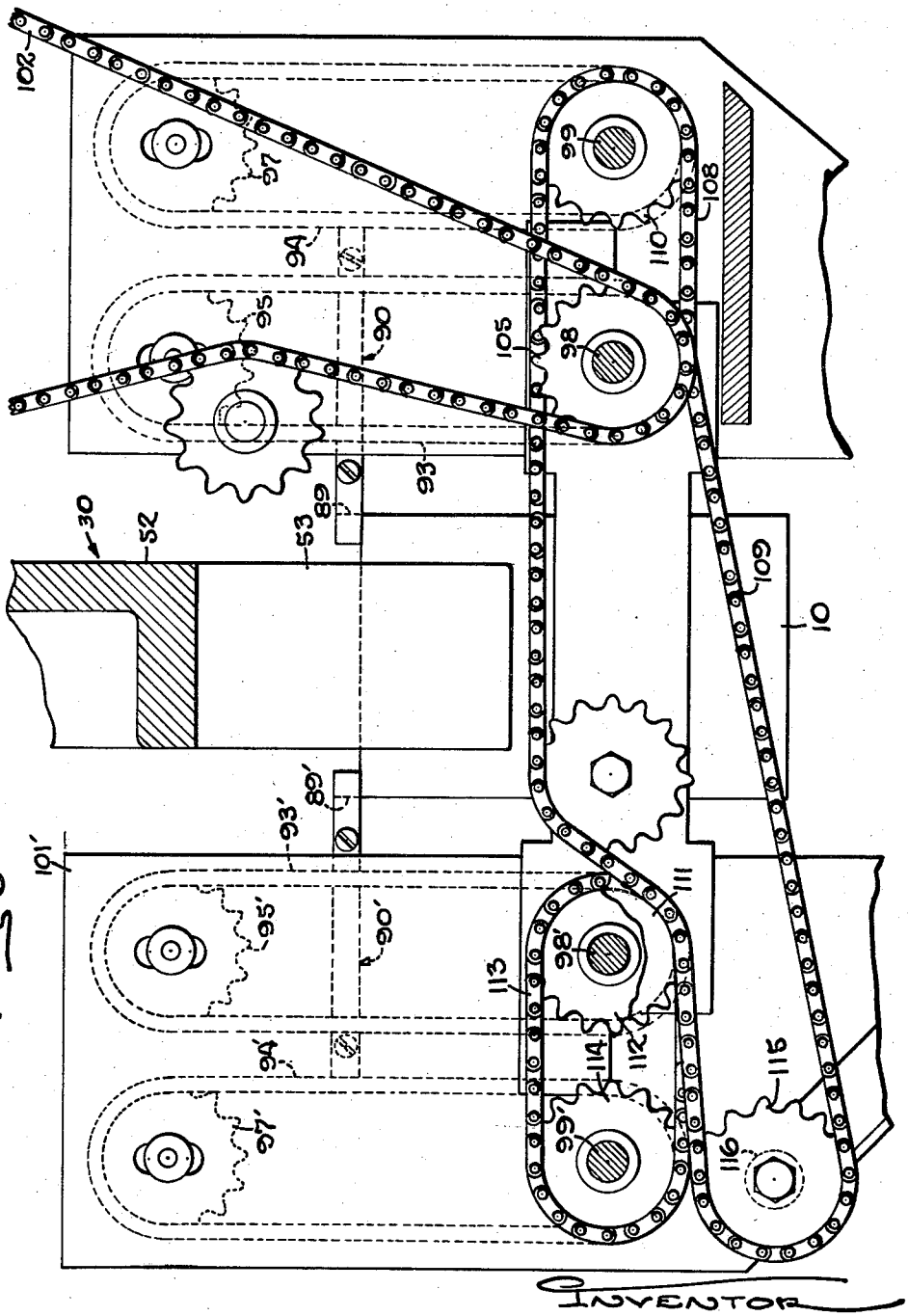

Fig. 3

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PACKAGING MACHINE

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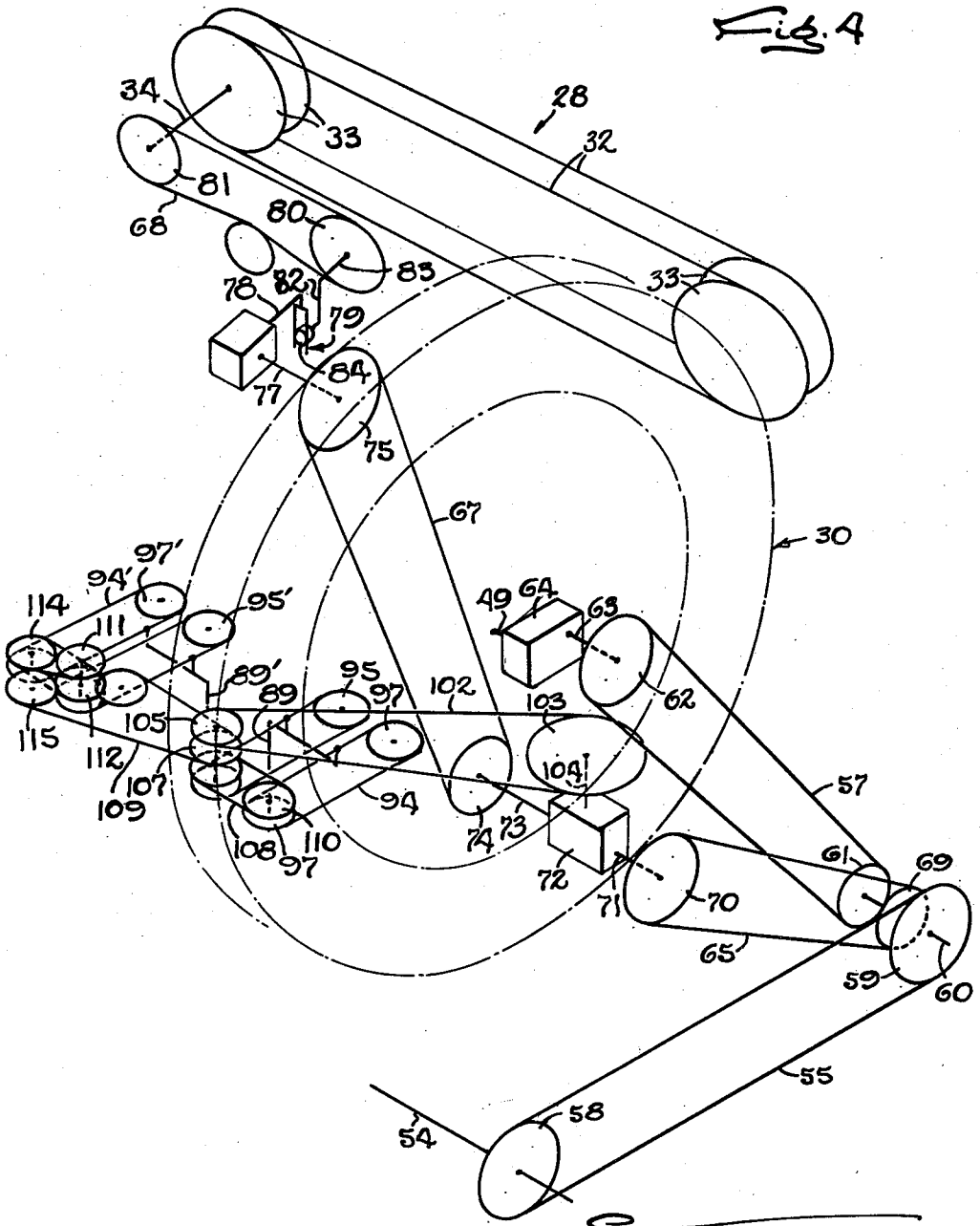
Fig. 4



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PACKAGING MACHINE

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Fig. 5

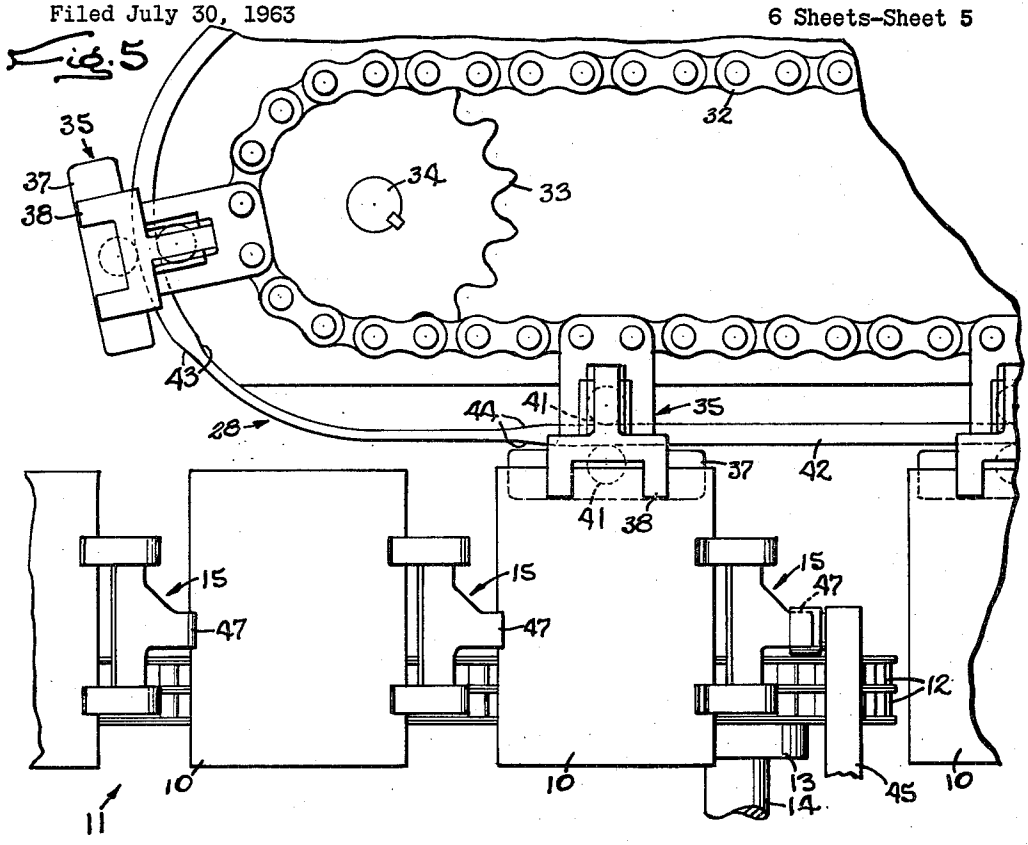


Fig. 6

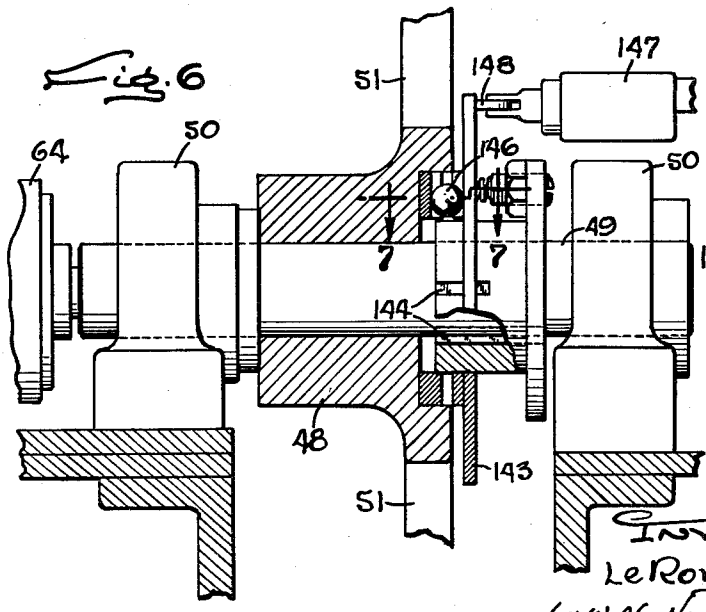
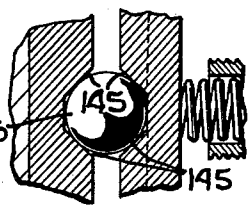


Fig. 7



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June 29, 1965 LE ROY L. MARTIN 3,191,748

PACKAGING MACHINE

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Fig. 8

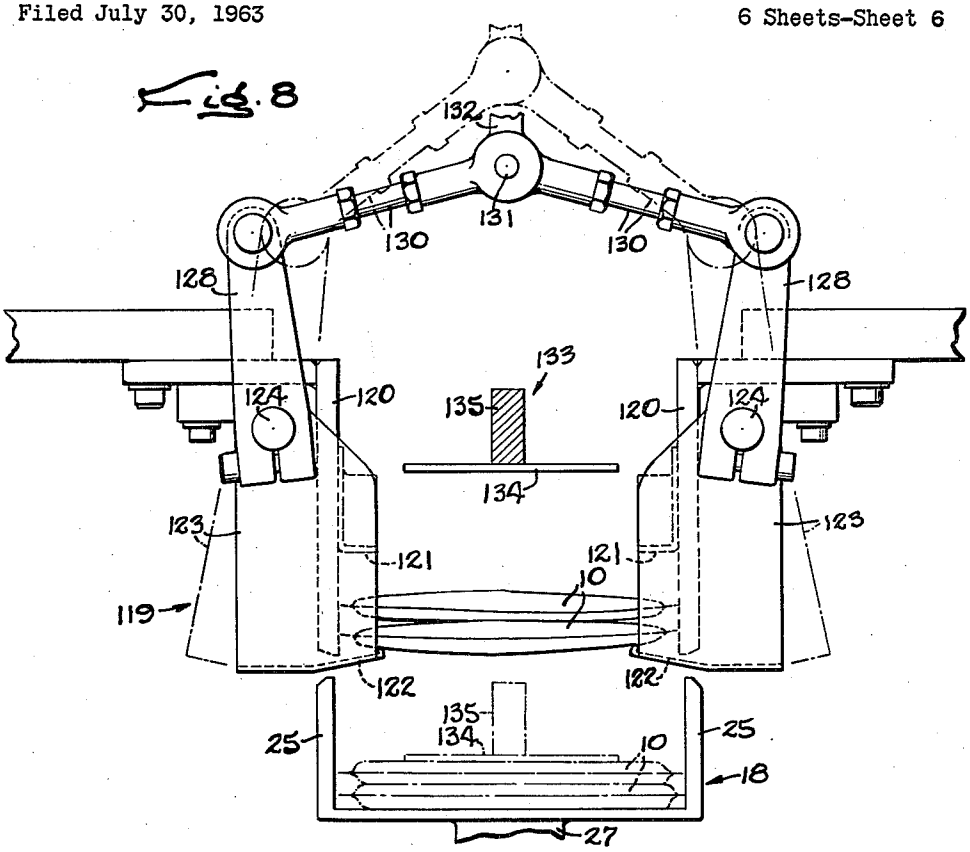
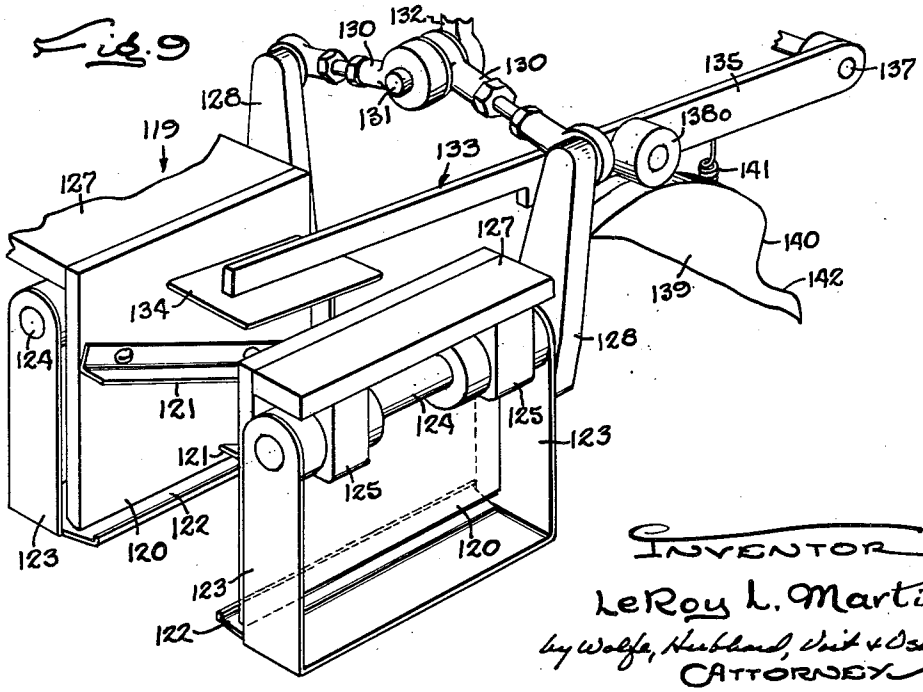


Fig. 9



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United States Patent Office 3,191,748 Patented June 29, 1965

3,191,748

PACKAGING MACHINE

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Filed July 30, 1963, Ser. No. 298,694
13 Claims. (Cl. 198—25)

This invention relates to packaging machines of the general type in which packages such as envelope-type bags are formed, filled and closed and subsequently loaded into cartons, and relates more particularly to mechanism for transferring the completed bags from the bag-forming portion of the machine to a conveyor from which the bags are to be loaded in cartons. The invention is particularly well suited for use in so-called continuous motion machines which operate at high speed.

The primary object of the present invention is to provide improved mechanism for transferring bags to the carton conveyor at high speed while arranging the bags in stacks of the desired number and in the proper attitude for eventual loading in cartons, the mechanism maintaining positive control of the bags at all times and being easily modified to vary the number of bags in each stack as desired.

A more specific object is to utilize a rotary transfer wheel having peripheral pockets for holding the bags and continuously rotating in one direction, in conjunction with a novel loading device for simultaneously picking a selected number of bags out of adjacent pockets on each stroke of the loading device and stacking the bags for loading onto the conveyor.

Another object is to transfer the bags into the rapidly rotating wheel in a novel manner quickly, smoothly and without danger of damage to the bags.

The invention also resides in the manner of collecting the bags removed from the transfer wheel and loading the bags quickly and positively into spaced buckets on the continuously moving conveyor.

Still another object is to distribute the product evenly in the bags and flatten the latter as an incident to the loading of the buckets.

Other objects and advantages of the invention will become apparent from the following detailed description taken in connection with the accompanying drawings, in which

FIGURE 1 is a fragmentary cross-sectional view taken in a transverse vertical plane through a packaging machine embodying the novel features of the present invention, the plane of the section being adjacent the transfer station of the machine.

FIG. 2 is an enlarged fragmentary sectional view taken along the line 2—2 of FIG. 1.

FIG. 3 is a fragmentary plan view of the mechanism shown in FIG. 2.

FIG. 4 is a schematic perspective view of the driving mechanism of a portion of the machine.

FIG. 5 is an enlarged fragmentary side elevational view taken in the direction of the arrows 5—5 of FIG. 1.

FIG. 6 is an enlarged fragmentary sectional view taken along the line 6—6 of FIG. 1.

FIG. 7 is an enlarged fragmentary section taken along the line 7—7 of FIG. 6.

FIG. 8 is an enlarged fragmentary sectional view taken along the line 8—8 of FIG. 1.

FIG. 9 is a fragmentary perspective view of part of the mechanism shown in FIG. 8.

As shown in the drawings for purposes of illustration, the invention is embodied in a high-speed continuous motion packaging machine for forming, filling and closing packages such as flat, envelope-type bags 10 and loading

the bags into cartons (not shown). The bags initially are formed with open upper ends and are advanced on a carrier 11 (FIG. 5) through filling and closing stations on the forward portion (not shown) of the machine where each bag receives a measured charge of the product and is sealed closed, these operations being performed by apparatus well known to those skilled in the art and forming no part of the present invention.

The illustrative bag carrier shown in FIG. 5 is formed by a pair of endless chains 12 disposed side-by-side in horizontal planes and trained around sprocket wheels 13 fast on horizontally spaced vertical shafts 14 suitably journaled on the machine frame, one of the shafts being rotated by the power actuator of the machine to drive the chains with a continuous motion. Clips 15 spaced along and mounted on the chains grip the leading edge of each bag to hold the latter on the chains and advance the bag endwise along a path defined by one straight run of the chains. The clips which are of a well known construction, are pivoted on the chains to swing outwardly and release the bags.

Upon reaching the end of the bag carrier 11, the bags 10 are transferred to a conveyor 17 (FIG. 1) and stacked in equally spaced buckets 18 thereon preparatory to loading into the cartons. As shown on the right in FIG. 1, this conveyor takes the form of a pair of endless chains 19, only the upper runs of which are shown, disposed in vertical planes and supported and driven in the usual manner to carry the buckets one by one through a loading station 20 with a continuous motion. Each chain rides in a guide groove formed between a lower guide rail 21 upstanding from a portion 22 of the machine frame and an upper guide rail 23 overlying both lower rails and holding the chains down in sliding engagement with the lower rails.

The buckets 18 are of U-shaped front to rear cross-section (see FIGS. 1 and 8) formed by a horizontal bottom wall 24 with vertical side walls 25 projecting upwardly from the leading and trailing edges of the bottom wall. To support the buckets above the chains 19, lugs 27 project downwardly from the underside of each bucket on opposite sides of the top guide rail 23 and are fastened to links of the chains. In the buckets, the bag 10 lie on their sides in position to be pushed laterally off the conveyor into a carton alined with one open end of the bucket.

Machines of this general type are capable of high-speed operation, producing and cartoning packages at rates as high as 300 per minute. In some instances, only one bag 10 will be inserted in each carton while in other cases two or more bags are stacked side-by-side in each carton.

The present invention contemplates the provisions of improved mechanism for transferring the bags 10 from the bag carrier 11 to the buckets 18 at high speed while arranging the bags in stacks of the desired number and in the proper attitude for eventual loading into the cartons. This transfer mechanism maintains positive control of the bags during the transfer and is easily modified to vary the number of bags stacked in each bucket. To these ends, the transfer mechanism includes a transfer carrier 28 for removing each bag from the first carrier 11 and advancing the bags one by one to a transfer station 29, a rotary transfer wheel 30 journaled on the machine frame at the transfer station for carrying the bags from the transfer station to the loading station 20 adjacent the conveyor 17 while turning each bag into the proper attitude, and a loading device 31 at the loading station operable to pick a selected number of bags out of the transfer wheel and load the bags in a stack into a bucket 18 on the conveyor.

In the present instance, the transfer carrier 28 (see FIGS. 1, 4 and 5) is formed by two endless chains 32 disposed side-by-side in vertical planes and wrapped around horizontally spaced sprocket wheels 33 keyed to shafts 34

journaled on the machine frame above the level of the bag carrier 11 with one end portion of the transfer carrier overlapping the downstream end of the bag carrier as shown in FIG. 5. Clips 35 are fastened to the chains to project downwardly from the lower runs thereof and grip the tops of the bags on the bag carrier.

Each of these clips comprises a first finger 37 which extends downwardly behind the top of the associated bag, and a second finger 38 having two prongs extending downwardly in front of the bag top. The fingers are pivoted on the body of the clip and are urged toward each other by a tension spring 39 (FIG. 1) stretched between two arms 40 projecting inwardly from the respective fingers. Follower rollers 41 (see FIG. 5) journaled on the arms ride on opposite sides of a cam bar 42 behind the packages. Fall surfaces 43 (FIG. 5) on the bar permit the spring 39 to open the clips before the latter reach the package to be gripped, and rise surfaces 44 on the bar close the clip after the fingers 37, 38 are in positions straddling the bag tops. After the bags are gripped by the clips 35, the clips 15 on the bag carrier 11 release the bags and pass around the sprocket wheels 13 as shown in FIG. 5, the release being effected by an arm 45 engageable with a finger 47 projecting forwardly from each clip to swing the clip into an open position as the clip passes around the sprocket wheel.

As shown most clearly in FIG. 1, the transfer wheel 30 comprises a hub 48 mounted on a shaft 49 paralleling the path of the bags on the transfer carrier 28 and journaled in bearings 50 (FIG. 6) on the frame directly below the path with a plurality of spokes 51 radiating from the hub and supporting a concentric ring-shaped body 52 rotatable about the axis of the shaft in a plane perpendicular to the path of the bags. The periphery of the ring 52 is disposed slightly below the level of the bottoms of the bags on the transfer carrier 28. Equally spaced around the periphery of the ring are a plurality of radially projecting arms 53 somewhat narrower than the width of the bags 10 (see FIG. 2) and defining a series of radially and axially opening pockets equally spaced around the wheel, adjacent arms being spaced apart a distance substantially greater than the thickness of the bags. The wheel is rotated continuously in one direction, clockwise in FIG. 1, by the continuously rotating cycle shaft 54 (FIG. 4) of the machine through two endless chains 55 and 57 (see FIGS. 1 and 4). The first chain 55 is trained around sprocket wheels 58 and 59 on the cycle shaft and on a parallel idler shaft 60 journaled on the frame, and the second chain 57 is trained around a sprocket wheel 61 fast on the idler shaft and around another sprocket wheel 62 on a stubshaft 63 journaled in a gear box 64 in which the wheel shaft 49 also is journaled, and geared to the shaft 49 by the gearing in the box.

With this arrangement, successive pairs of arms 53 passing over the top of the wheel pass through a position straddling the path of the bags 10 on the transfer carrier 28 as shown in FIG. 1. Thus, the terminal bag on the carrier may be advanced in between the straddling pair of arms and released to settle into the pocket between the arms and onto the periphery of the ring 52.

The transfer carrier 28 also is driven from the cycle shaft 54 by means of a series of chains 65, 67 and 68 shown schematically in FIG. 4. The chain 65 is driven by a sprocket wheel 69 on the idler shaft 60 and drives a sprocket wheel 70 on a stubshaft 71 journaled in a gear box 72 and geared to a second stubshaft 73 carrying a sprocket 74 driving the chain 67 and another sprocket 75. The latter is mounted on a stub shaft 77 geared to a crank shaft 78 carrying a crank 79 which rotates a sprocket 80 driving the chain 68. This chain is trained around a sprocket 81 fast on the shaft 34 and thereby rotates the transfer carrier sprockets 33.

With the transfer wheel 30 rotating at high speed and the arms 53 thereon relatively closely spaced, the transfer carrier 28 must move the bags 10 rapidly into the pockets to clear the arms. At the same time, the transfer carrier must pick up the bags moving at the speed of the bag carrier 11. To effect these transfers quickly, smoothly and without danger of damage to the bags, the transfer carrier is driven continuously but at an intermittently variable speed produced by the crank 79 and a cooperating crank 82 on the shaft 83 of the sprocket 80. The two crank shafts are offset radially from each other and are slidably connected by a roller 84 on the crank 82 fitted between parallel arms forming the crank 79.

As the latter rotates, the roller 84 is rotated eccentrically about the driving shaft 78 and thus varies the speed of rotation of the sprockets 33 and the corresponding rate of advance of the transfer carrier 28. It will be apparent to those skilled in the art that the speeds of the bag carrier 11, the transfer carrier 28, and the transfer wheel 30 may be correlated so that the clips 35 on the transfer carrier approach bags on the bag carrier at high speed, slow down to pick up the bags, accelerate to insert each bag in a transfer wheel pocket and slow down after the bag is in the pocket. The release is effected by cam surfaces (not shown) on the cam bar 42 similar to the fall surfaces 43 and operable to open each clip 35 when the bag therein is properly positioned between the straddling arms 53 with the opposite edge portions of the bag projecting beyond opposite sides of the arms.

In this position, each bag is carried around the wheel 30 to the loading station 20 which is located approximately ninety degrees in a clockwise direction from the transfer station 29. Thus, each bag is turned from the upright position in which it was carried along both carriers 11 and 28 to a horizontal position in which it is to be loaded into a bucket 18 on the conveyor 17. Arcuate retaining plates 87 and 88 (FIGS. 1 and 2) are mounted on opposite sides of the arms 53 and extend from the transfer station to a point just short of the loading station. The upper end portion (not shown) of the downstream plate 88 preferably extends across the path of the bags on the transfer carrier to form a positive stop for the bags entering the wheel.

To effect the transfer of bags 10 into the buckets 18 at the loading station 20, the loading device 31 includes two elements 89 movable radially outwardly along horizontal paths closely adjacent the opposite sides of the transfer wheel 30 and the edges of the arms 53 and engageable with the projecting edge portions of the bags to push the latter radially out of the pockets in the wheel. Herein, these elements comprise two vertical fingers formed by the legs of L-shaped bars 90 mounted on the frame for orbital movement first along paths that carry the legs 89 horizontally and outwardly along the sides of the wheel, then away from the wheel along arcuate portions of the paths, then radially inwardly along return paths spaced from the sides of the wheel, and finally back toward the wheel to retrace the outward paths.

For this purpose, the horizontal leg 91 of each bar 90 is secured by two pivot pins 92 to two endless chains 93 and 94 disposed side-by-side in a common horizontal plane as shown most clearly in FIGS. 2 and 4 with the leg 91 generally perpendicular to the straight runs of the chains. Each chain is trained around two sprocket wheels 95 and 97 fast on vertical stub shafts 98 and 99 journaled in vertically spaced horizontal plates 100 and 101 mounted on the machine frame adjacent on one side of the wheel, the inner one of each pair of sprockets being spaced inwardly from the inner end of the bags at the loading station and the outer sprocket of each pair being spaced outwardly from the free ends of the arms 53 on the wheel. The two loader assemblies are substantially the same and corresponding parts of the left-hand assembly in FIG. 2 are indicated by corresponding primed reference numbers.

To drive the loading device, an endless chain 102 (see FIG. 4) driven by a sprocket wheel 103 on a stub shaft

104 rotated by the gearing in the box 72 drives one of the loader chain shafts 98 as shown in FIG. 2, and two sprocket wheels 105 and 107 on the upper end portion of this shaft drive two additional chains 108 and 109, the former being trained around a sprocket wheel 110 on the upper end of the shaft 99 of the companion loader chain 94 to drive the same with the chain 93. The other drive chain 109 extends across the wheel 30 and around a sprocket wheel 115 fast on a shaft 116 journaled on the plates 100', 101' and spaced outwardly from the shaft 99'. This chain also meshes with the teeth on one side of a sprocket wheel 111 on the shaft 98' to drive the loader chain 93' and an additional sprocket 112 on the shaft, and this additional sprocket drives another chain 113 driving the companion loader chain 94' through a sprocket 114 on the shaft 99'. The shafts 98 and 98' turn in opposite directions to drive the chains 93' and 94' clockwise (FIG. 3) and the chains 93 and 94 counterclockwise so that the two loader legs 89, 89' move outwardly along the sides of the wheel in unison. It will be seen that the loader legs lie along chords of the wheel 30 as they move outwardly along the sides of the wheel.

In this instance, the legs 89, 89' are long enough to engage the bottom or inner edges of bags in two adjacent pockets on the wheel as shown in FIG. 2, and the timing of the loading device 31, 31' is such that the legs pick off the bags two at a time during each forward stroke of the loader, sliding the bags out of the pockets as the latter pass through the loading station 20. Preferably, a pair of stops in the form of bars 117 (FIGS. 1 and 2) having upper sides forming ledges 118 more closely spaced than the width of the bags are provided at the loading station to stop the descent of the lower bag of the pair as shown in FIG. 2 as the associated arm continues on and the loader engages the two bags. With this arrangement, the trailing bag of the pair partially overtakes the leading bag and the spacing of the bags decreases.

Mounted on the frame in the path of these bags and directly above the conveyor 17 is a holder 119 (see FIGS. 1, 8 and 9) which catches the bags and holds the same in a stack until a bucket 18 is positioned below the holder to receive the stack. Herein, the holder comprises two upright guide plates 120 spaced apart a distance approximately the same as the width of the bags and disposed on opposite sides of the path followed by the bags removed from the wheel by the loader 31, 31'. A pair of downwardly inclined angle bars 121 on the adjacent sides of the plates guide the top bag of the pair downwardly onto the lower bag as the bags move into the holder.

To hold the two bags 10 releasably between the plates 120 until a bucket 18 is beneath the holder, two elongated fingers 122 project inwardly beneath the guide plates and the opposite edge portions of the bags and are more closely spaced than the width of the bags. Thus, the bags come to rest on and are supported by these fingers as shown in FIG. 8. The fingers 122 are the crosspieces of two U-shaped plates having upright legs 123 journaled on the holder by means of horizontal rods 124 rotatably mounted in bearings 125 (FIG. 9) depending from brackets 127 projecting outwardly from the top of the rear side of each guide plate 120. On one end of each rod is a crank arm 128 pivotally connected by toggle links 130 to a pin 131 movable upwardly and downwardly to rock the upper ends of the cranks toward and away from each other and thereby swing the holding fingers 122 alternately toward and away from each other, the motion of the holding fingers being opposite the motion of the associated crank. The alternate positions of the cranks, links and fingers are shown in broken lines in FIG. 8. As the fingers separate, the stack of bags in the holder is released into the conveyor 17. The up and down motion of the central pivot 131 in timed relation with the motion of the transfer wheel 30, the loader 31, 31' and the conveyor is produced in a well known manner by a cam and follower connection (not shown) with an upright link 132 carrying the pin 131, the link 132 moving endwise up and down at the appropriate times.

In order to transfer the stacks to the buckets 18 positively rather than relying on gravity fall of the bags, a pusher 133 (FIGS. 8 and 9) is provided to engage the top of the stacks as the fingers 122 separate, and press the stack downwardly at high speed into the passing bucket which, of course, is moving at a continuous speed through the loading station 20. The pusher includes a flat plate 134 fast on the end of a lever arm 135 pivoted at its opposite end at 137 (FIG. 9) on the machine frame to swing the plate up and down through the holder 119. Intermediate the ends of the lever is a follower roller 138 riding on a disk like cam 139 constantly rotating with the cycle shaft 54 and having at least one fall surface 140 which permits a coiled tension spring 141 to depress the free end of the lever as the fingers separate. A closely following rise 142 almost immediately raises the pusher back to the out-of-the-way position shown in FIGS. 8 and 9.

In addition to producing positive, high-speed loading of the stacks of bags 10 in the buckets 18, this pusher 133 also serves the purpose of flattening the bags in the buckets for a more attractive package with approximately uniform product distribution as shown in broken lines in FIG. 8. This has the additional advantage of efficiently utilizing carton space. It will be seen that the product initially settles into the lower ends of the upright bags (see FIG. 1) and remains substantially in this condition until the bags are pressed into the buckets. By making the downward stroke of the pusher long enough to press the bulging bags firmly against the bucket bottoms 20 and providing a spring 141 strong enough to flatten the bags at least partially, the bulges in the bags are eliminated as as incident to the transfer to the buckets.

Shown in FIGS. 6 and 7 is an emergency stop mechanism operable to shut off the machine in case there is a jam somewhere around the transfer wheel 30. This mechanism includes a ring 143 telescoped onto the wheel shaft 49 adjacent the hub 48 of the wheel and keyed at 144 to the shaft for rotation therewith. On the side of the ring adjacent the wheel hub is a seat in which one side of a ball 146 is fitted with the outer side of the ball fitting in a similar seat in the wheel hub. The side walls 145 of the seats are inclined as shown in FIG. 7 and the ring 143 is spring-pressed toward the hub so that the ball releasably couples the plate to the hub. The hub is freely rotatable on the shaft and is driven only through the ring.

If excessive resistance to rotation of the wheel develops due to a jam, the ball 146 and the inclined seat walls 145 coact to cam the ring 143 axially along the shaft 49 away from the hub 48. This motion of the ring is sensed by a switch 147 having an operator in the form of a roller 148 riding on the side of the ring opposite the wheel and operable when activated to shut off the machine. Thus, a jam anywhere around the wheel immediately disables the machine.

From the foregoing, it will be seen that the present invention provides an improved transfer mechanism capable of smooth high-speed operation while at all times maintaining positive control of the bags 10. The latter are moved at high speed between the arms 53 of the transfer wheel 30 by the carrier 28 with the so-called vari-speed drive which also accommodates the slower motion of the bag carrier 11. The wheel itself turns the bags ninety degrees onto their sides while moving them to the loading station 20 with a smooth and rapid continuous motion. In this respect, it should be noted that the more rigid bottoms of the bags are positioned for engagement with the loader fingers 89, 89' thereby avoiding problems of bending and collapsing that would result if the bags were pushed from the opposite ends.

Of course, the loading device 31, 31' engages both sides of the bags during removal of the latter from the pockets

around the wheel, and may be adapted for removing different numbers of bags during each outward stroke simply by changing the length of the fingers 89, 89' and making any corresponding alterations required in the timing of the drive mechanism relative to the speeds of the wheel 30 and the conveyor 17. The result is a versatile transfer mechanism.

Finally, the holder 119 collects the bags in stacks of the desired size and cooperates with the pusher 133 in loading the stacks into the buckets 18 on the continuously moving conveyor 17. As an incident to this transfer, the bags are flattened to obtain a more attractive package and permit more effective utilization of carton space.

I claim as my invention:

1. In a machine for handling flat packages of at least a predetermined width, the combination of, a frame, a carrier on said frame movable along a predetermined path to a transfer station, clips equally spaced along said carrier for gripping the tops of a succession of said packages and releasing the same at said transfer station, mechanism for driving said carrier continuously at a speed varying intermittently between relatively rapid and relatively slow to advance said packages to said transfer station, a rotary transfer wheel journaled on said frame below said transfer station and in a plane perpendicular to said path with the periphery of the wheel adjacent the bottom edges of the packages at the transfer station, a plurality of radially projecting arms narrower than the width of said packages and equally spaced around the periphery of said wheel to define a series of radially and axially opening pockets, said arms projecting upwardly when on top of the wheel to straddle said path, mechanism for rotating said wheel continuously in one direction to swing successive pockets through said transfer station, the steps in the speed of said carrier being correlated with the rotation of said wheel whereby each package is moved at the rapid rate between each pair of arms passing said transfer station and deposited in the pocket with the opposite edge portions of the package projecting beyond the arms, a loading device mounted on said frame approximately ninety degrees in said one direction from said transfer station and including two elements movable horizontally and radially outwardly closely adjacent the opposite side edges of said arms to engage said projecting edge portions of a predetermined number of adjacent packages and remove the packages radially from the wheel, and mechanism for driving said loading device in timed relation with the rotation of said wheel.

2. In a machine for handling packages of at least a predetermined width, the combination of, a frame, a rotary wheel journaled on said frame, a plurality of radially projecting arms narrower than the width of said packages and equally spaced around the periphery of said wheel to define a series of equally spaced radially and axially opening pockets, mechanism for rotating said wheel in one direction to swing successive pockets first through a transfer station to receive a package in each pocket with opposite edge portions thereof projecting axially beyond the edges of said arms, and then through a loading station angularly spaced from said transfer station, a loading device mounted on said frame at said loading station and engageable with said opposite edge portions to move the packages radially out of said pockets, said loading device including two elements mounted on said frame for movement first along paths extending radially outwardly closely adjacent the sides of said wheel and the edges of said arms to engage the package edges and remove the packages, and then along return paths extending radially inwardly and spaced from said wheel and the packages thereon, and mechanism for operating said loading device in timed relation with the rotation of said wheel.

3. A machine as defined in claim 2 in which said elements extend along chords of said wheel and are elongated to engage and remove more than one package during each outward stroke.

4. A machine as defined in claim 3 further including stops mounted on said frame to engage the projecting edge portions of packages reaching said transfer station and stop their movement around the wheel at a preselected point preparatory to removal of the packages from said pockets whereby the spacing between the leading package and the next trailing package engaged by said elements decreases during such removal.

5. In a packaging machine, the combination of, a frame, a rotary transfer wheel journaled on said frame, means defining a series of pockets equally spaced around the periphery of said wheel and opening radially outwardly, mechanism for rotating said wheel continuously in one direction to swing successive pockets first through a transfer station to receive a package in each pocket passing through the transfer station, and then through a loading station angularly spaced from said transfer station, a holder mounted on said frame at said loading station, a loading device at said loading station operable to remove the packages from at least two adjacent pockets passing through said loading station and load the packages into said holder in stacks, means on said holder for releasably supporting said stacks, a conveyor mounted on said frame adjacent said holder having a series of equally spaced buckets thereon, mechanism for advancing said conveyor with a continuous motion past said holder, a pusher movable back and forth through said holder toward and away from said conveyor to transfer successive stacks out of the holder and into said buckets, and mechanism for operating said pusher in timed relation with said loading device and said conveyor thereby to load successive stacks into successive buckets on said conveyor.

6. A machine as defined in claim 5 in which the stroke of said pusher is long enough to press and flatten the stacks against the bottoms of said buckets.

7. In a machine for handling packages of at least a predetermined width, the combination of, a frame, a rotary wheel journaled on said frame, a plurality of radially projecting arms narrower than the width of said packages and equally spaced around the periphery of said wheel to define a series of equally spaced radially and axially opening pockets, mechanism for rotating said wheel in one direction to swing successive pockets first through a transfer station and then through a loading station angularly spaced from said transfer station, means for inserting a package in each pocket at said transfer station and positioning the packages with opposite edge portions thereof projecting axially beyond the edges of said arms, and a loading device mounted on said frame at said loading station and engageable with said opposite edge portions to move the packages radially out of said pockets.

8. In a packaging machine, the combination of, a frame, a carrier on said frame for advancing a succession of articles along a predetermined path to a transfer station and releasing each article at said station, a rotary transfer wheel journaled on said frame below said station for rotation in a plane perpendicular to said path with the periphery of said wheel passing closely adjacent said path, a plurality of arms equally spaced around said wheel and extending radially outwardly from the periphery thereof with adjacent arms spaced to straddle said path in one angular position of the wheel, mechanism for rotating said wheel continuously in one direction and at high speed to swing said arms rapidly through said station, and mechanism for driving said carrier constantly at an intermittently varying speed to move said articles into said station and between said arms at a relatively high speed and then move the articles more slowly during release.

9. In a packaging machine, the combination of, a frame, a carrier on said frame for advancing a succession of articles along a predetermined path to a transfer station and releasing each article at said station, a rotary transfer wheel journaled on said frame below said station

for rotation in a plane perpendicular to said path with the periphery of said wheel passing closely adjacent said path, a plurality of arms equally spaced around said wheel and extending radially outwardly from the periphery thereof with adjacent arms spaced to straddle said path in one angular position of the wheel, mechanism for rotating said wheel continuously in one direction and at high speed to swing said arms rapidly through said station, and mechanism for driving said carrier in timed relation with the rotation of said wheel to advance an article between each pair of arms passing said station and release the article to be carried around the wheel.

10. In a packaging machine, the combination of, a frame, a carrier on said frame for advancing a succession of articles along a predetermined path to a transfer station and releasing each article at said transfer station, a rotary transfer wheel journaled on said frame adjacent said transfer station and below said path for rotation in a plane extending transversely of said path with the periphery of the wheel passing through the transfer station, a plurality of radially extending arms forming a series of axially and radially opening pockets equally spaced around the periphery of said wheel, mechanism for rotating the wheel in one direction to swing one pocket through the transfer station as each article is released by said carrier whereby the articles are released while straddled by two of said arms and are deposited in said pockets and carried therein around the wheel to a loading station angularly spaced from said transfer station, and a loading device mounted on said frame adjacent said wheel and operable to remove successive articles radially from the pockets passing through the loading station.

11. In a machine for handling packages of at least a predetermined width, the combination of, a rotary transfer wheel mounted on said frame for rotation in a vertical plane, a plurality of radially projecting arms narrower than the width of said packages and equally spaced around said wheel to define a series of radially and axially opening pockets, mechanism for rotating said wheel in one direction to swing successive pockets first through a transfer station adjacent the top of the wheel to receive a package in each pocket with the package projecting outwardly on at least one side of the wheel, and then through a loading station angularly spaced from said transfer station, and a loading device mounted on said frame at said loading station and including an element movable back and forth along said one side first radially outwardly along and closely adjacent said one side to engage the projecting portion of the package in the pocket at said loading station and remove the package radially from the wheel, and then radially inwardly along a return path spaced from said one side preparatory to the removal of the next package.

12. The combination defined in claim 11 in which said element is constructed to engage the packages in two adjacent pockets at said loading station and remove the packages simultaneously from said wheel.

13. In combination defined in claim 12 further including means at said loading station for catching the two packages after removal from said wheel and holding the packages releasably in a stack.

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